

# Frequency and Distribution of Teeth Requiring Endodontic Treatment in Jeddah Subpopulation: A Retrospective Cross-sectional Study

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## Abstract

**Introduction:** This study was done with the objective of determining the frequency and distribution of teeth requiring endodontic treatment in Saudi Arabia subpopulation. **Materials & Methods:** A retrospective, cross-sectional study was done in the Department of Clinical Sciences, Dental Program, Batterjee Medical College, Jeddah, Saudi Arabia. Patient's data (age, gender, arch and type of tooth involved) that underwent root canal treatment from 1st January 2018 to 31st December 2018 was collected and analyzed. **Results:** Out of 3731 patients, 538 teeth required endodontic treatment. More male patients undergone root canal treatment as compared to females, and most root canal treatments were done in young adult patients. Most of the teeth that required root canal treatment were posteriors. **Conclusion:** This study showed that root canal treatment was done more in males, in mandibular posteriors and in young adult patients.

**Keywords:** Oral health; Epidemiology; Root canal treatment; Jeddah

## Introduction

The fourth most expensive disease to treat in most industrialized countries, are oral diseases, which if not treated can affect both, the teeth and the surrounding tissues and thus compromise the phonetic functions, nutrition, aesthetics and even the overall health status of the individual. <sup>[1]</sup> Dental caries is affected by factors such as age, sex, oral hygiene habits and socioeconomically status, and is the most common disease worldwide. <sup>[2]</sup> Dental caries is not only the most common cause of tooth loss, <sup>[3]</sup> but also the main source of irritation of dental pulp and periradicular tissues <sup>[2]</sup> and is considered to be one of the main reasons for endodontic treatment. <sup>[2,4]</sup> Thus, to prevent pulpal exposure and the need for endodontic therapy in future, it is important to reinforce oral hygiene measures after identifying the most frequently involved tooth. <sup>[3]</sup>

Dental health records based on epidemiological studies provides great value to assess the incidence and frequency of teeth requiring endodontic treatment. <sup>[4]</sup> But, there is lack of data on the need of endodontic treatment in relation to sociodemographic aspects. <sup>[2]</sup> Considering the importance of epidemiological studies and records, this study was done with the objective of determining the frequency and distribution of teeth requiring endodontic treatment in Saudi Arabia subpopulation.

## Materials and Methods

In this retrospective, cross-sectional study, after obtaining clearance from ethical committee of Batterjee Medical College, Saudi Arabia, patient's data (age, gender, arch and type of tooth involved) that underwent Root Canal Treatment (RCT)

from 1st January 2018 to 31st December 2018, was tabulated and analyzed, from the database of the Department of Clinical Sciences, Dental Program, Batterjee Medical College, Jeddah, Saudi Arabia. Based on age, patients were divided in 5 groups, comprising of children (<15 years), adolescent (between 15 to 18 years), young adults (>15 and <28 years), middle age adults (>28 and <48 years), and older adults (>48 years).

The inclusion criterion for patients was as follow:

- Patients who underwent RCT at BMC because of pain / swelling / treatment plan to restore the occlusion.

The exclusion criteria for patients were as follows:

- Intentional RCT for aesthetic purpose.
- Patient with multiple systemic diseases.

Tabulated data was statistically analyzed using Descriptive statistics, Chi-square test, with the application of Statistical Package for the Social Sciences (SPSS) version 16.0. P-value  $\leq$  0.05 was taken as statistically significant.

## Results

The prevalence of endodontic treatment at BMC clinic is found

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to be 14.42%. The study sample comprises of 3731 patients and the number of teeth involved was 538. 315 teeth (58.5%) belong to young adult patients, followed by middle age adult patients who had 154 teeth (28.6%), than comes older adult patients with 33 teeth (6%), than child patients with 19 teeth (3.5%) and least in adolescent patients with 17 teeth (3.1%).

The mean age of participants was 33.12 years, and more male patients (354) had undergone RCT as compare to females (184) [Table 1]. In female patients 107 teeth (58.2%) were located in mandible and 77 (41.8%) were located in the maxilla [Table 2], and irrespective of jaw, 59 (32%) were anterior teeth and 125 (68%) were posterior teeth [Table 3]. In male patients 200 teeth (56.5%) were located in mandible and 154 (43.5%) were located in the maxilla [Table 2], and irrespective of jaw, 101 (28.5%) were anterior teeth and 253 (71.5%) were posterior teeth [Table 3].

The incidence of RCT in children and adolescent patients is significantly higher in lower posteriors ( $P < 0.001$ ), and in young adult patients it is significantly higher in upper posteriors ( $P < 0.001$ ), while in middle age and old age patients, it is significantly higher in lower anteriors ( $P < 0.001$ ) [Table 4 & Table 5]. On comparing incidence of RCT, we did not find any significant association of relationship of gender with the type of arch ( $P = 0.713$ ) [Table 2] or with position of tooth on arch ( $P = 0.394$ ) [Table 3].

### Discussion

In our study, the prevalence of endodontic treatment was found to be 14.42%, which is within the finding (2% to 21%) that has been reported in previous studies.<sup>[5-13]</sup> In our study, more males underwent RCT in comparison to females, which is in

**Table 1: Mean age of the patients.**

Patients	N	Mean	Std. Deviation
Female patients	184	32.65	13.55
Male patients	354	33.36	12.68
Total patients	538	33.12	12.98

**Table 2: Relationship of gender and type of arch.**

Patients	Arch	Frequency	Percent	Chi-square value	p value
Female patients	Lower	107	58.2	0.135	0.713
	Upper	77	41.8		
	Total	184	100.0		
Male patients	Lower	200	56.5		
	Upper	154	43.5		
	Total	354	100.0		

**Table 3: Relationship of gender and position on the arch.**

Patients	Tooth position	Frequency	Percent	Chi-square value	p value
Female patients	Anterior	59	32.1	0.723	0.394
	Posterior	125	67.9		
	Total	184	100.0		
Male patients	Anterior	101	28.5		
	Posterior	253	71.5		
	Total	354	100.0		

**Table 4: Relationship of age and type of arch.**

Ages	Arch	Frequency	Percent	Chi-square value	p value
Child	Lower*	13*	68.4	21.631	<0.001
	Upper	6	31.6		
	Total	19	100.0		
Adolescent	Lower*	12*	70.6		
	Upper	5	29.4		
	Total	17	100.0		
Young adult	Lower	159	50.5		
	Upper*	156*	49.5		
	Total	315	100.0		
Middle age	Lower*	94*	61.0		
	Upper	60	39.0		
	Total	154	100.0		
Older adult	Lower*	29*	87.9		
	Upper	4	12.1		
	Total	33	100.0		

**Table 5: Relationship of age and position on the arch**

Ages	Tooth position	Frequency	Percent	Chi-square value	p value
Child	Anterior	5	26.3	71.111	<0.001
	Posterior*	14*	73.7		
	Total	19	100.0		
Adolescent	Anterior	2	11.8		
	Posterior*	15*	88.2		
	Total	17	100.0		
Young adult	Anterior	62	19.7		
	Posterior*	253*	80.3		
	Total	315	100.0		
Middle age	Anterior*	64*	41.6		
	Posterior	90	58.4		
	Total	154	100.0		
Older adult	Anterior*	27*	81.8		
	Posterior	6	18.2		
	Total	33	100.0		

accordance with Tareen et al.<sup>[4]</sup> but in contradiction with other studies.<sup>[3,11,14-17]</sup> This difference might be because females take more care of their health<sup>[14]</sup> and appearance,<sup>[1]</sup> and thus show greater interest not only in maintaining proper oral hygiene, but also in having a regular dental check-ups,<sup>[2]</sup> that could help in an earlier diagnosis of a decayed tooth and thus preventing the progression of caries by getting the restoration done.

In our study, we found that highest number of RCTs were done in young adults and in mandibular posteriors followed by maxillary posteriors, and our finding is in accordance with Ahmed et al.<sup>[3]</sup> and in contradiction with Tassoker et al.<sup>[2]</sup> This might be because, posteriors remain for longer time in mouth, they have large pulp chambers, and their morphology facilitates the plaque accumulation.<sup>[2]</sup> Thus, making the teeth in young adults very prone to caries with pulp death as sequelae.<sup>[14]</sup> This brings to our attention the great need to further educate the patients, parents and teenagers with the importance of reinforcing oral hygiene measures and enlightening them with concern of consequences of failing to attempt the needs of sustaining a proper oral hygiene.

In the present study, middle and old age patients show decrease

in the total number of RCTs, and this is in contradiction with other studies,<sup>[11,18]</sup> where they found increase in endodontic treatment with aging, because of longer exposure to caries and function.<sup>[8]</sup> This difference might be, either because of attrition there is reduced pits and fissures on the occlusal surface and thus there is reduction in pulp disease sequel to caries,<sup>[14]</sup> or because patients prefer extraction instead of RCT, which might be because patients find it more costly<sup>[19]</sup> or not important for aesthetics.

In middle age and old age patients, more number of RCTs were done in lower anteriors, and this might be because, over a period of time pulp gets non-vital from bacterial infiltration through open dentinal tubules of attrited incisal edge, and thus initiates and triggers the pulpal pathosis, which in return would provide the necessary need for RCT to help restore the pulpally affected tooth. This attrition in lower anteriors might be because of stress, bruxism, dietary habits, or malocclusion. Unlike posteriors, patients opt for RCT in anteriors because of aesthetic reason.<sup>[14]</sup>

### Conclusion

Based on the results, we conclude that in the evaluated subpopulation:

- Pulpal disease affects all individuals, irrespective of age and gender.
- More number of males had undergone RCT as compared to females.
- Highest number of RCTs were done in young adults.
- Lower posteriors were the most commonly involved tooth.
- In middle and older age patients more number of RCTs were done in lower anteriors.

### Conflict of Interests

The authors declare that they have no conflict of interest.

### References

1. Oliveira BP, Camara AC, Aguiar CM. Prevalence of endodontic diseases: An epidemiological evaluation in a Brazilian subpopulation. *Braz J Oral Sci.* 2016;15:119-123.
2. Tassoker M, Gulec RAM, Sener SO. Investigation of the frequency and distribution of teeth requiring endodontic treatment and endodontically treated teeth 2017.
3. Ahmed H, Sadaf D, Rahman M. Frequency and distribution of endodontically treated teeth. *J Coll Physicians Surg Pak.* 2009;19:605-608.
4. Tareen SK, Qureshi A, Rehman S. Frequency and distribution of teeth requiring endodontic treatment in patients attending a free dental camp in Peshawar. *JKCD.* 2012;3:7-11.
5. Weiger R, Hitzler S, Hermle G, Lost C. Periapical status, quality of root canal fillings and estimated endodontic treatment needs in an urban German population. *Dent Traumatol.* 1997;13:69-74.
6. Jersa I, Kundzina R. Periapical status and quality of root fillings in a selected adult Riga population. *Stomatologija.* 2013;15:73-77.
7. Peciuliene V, Rimkuvienė J, Maneliene R, Ivanauskaite D. Apical periodontitis in root filled teeth associated with the quality of root fillings. *Stomatologija.* 2006;8:122-126.
8. Buckley M, Spangberg LS. The prevalence and technical quality of endodontic treatment in an American subpopulation. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 1995;79:92-100.
9. Loftus JJ, Keating AP, McCartan BE. Periapical status and quality of endodontic treatment in an adult Irish population. *Int Endod J.* 2005;38:81-86.
10. Peters LB, Lindeboom JA, Elst ME, Wesselink PR. Prevalence of apical periodontitis relative to endodontic treatment in an adult Dutch population: A repeated cross-sectional study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2011;111:523-528.
11. Kirkevang LL, Horsted-Bindslev P, Orstavik D, Wenzel A. Frequency and distribution of endodontically treated teeth and apical periodontitis in an urban Danish population. *Int Endod J.* 2001;34:198-205.
12. Tsuneishi M, Yamamoto T, Yamanaka R, Tamaki N, Sakamoto T, Tsuji K, et al. Radiographic evaluation of periapical status and prevalence of endodontic treatment in an adult Japanese population. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2005;100:631-635.
13. Taşsoker M, Akgunlu F. Radiographic evaluation of periapical status and frequency of endodontic treatment in a Turkish population: A retrospective study. *J Istanbul Univ Fac Dent.* 2016;50:10-16.
14. Umesi DC, Oremosu OA, Makanjuola JO, Nwachukwu NC. Frequency and distribution of teeth treated by single and multiple-visit root canal treatment in a Nigerian population by differently skilled operators. *Tropical Dent J.* 2016;39:56-64.
15. Molven O. Tooth mortality and endodontic status of a selected population group. Observations before and after treatment. *Acta Odontol Scand.* 1976;34:107-16.
16. Barbakow FH, Cleaton-Jones P, Friedman D. An evaluation of 566 cases of root canal therapy in general dental practice I. Diagnostic criteria and treatment detail. *J Endod.* 1980;6:456-60.
17. Hull TE, Robertson PB, Steiner JC, Del Aguila MA. Patterns of endodontic care for a Washington state population. *J Endod.* 2003;29:553-6.
18. Mukhaimer R, Hussein E, Orafi I. Prevalence of apical periodontitis and quality of root canal treatment in an adult Palestinian sub-population. *Saudi Dent J.* 2012;24:149-155.
19. Umanah AU, Osagbemi BB, Arigbode AO. Pattern of demand for endodontic treatment by adult patients in Port-Harcourt, South-South Nigeria. *West Afr J Med.* 2012;1:12-23.